

What is Claimed is:

1. (currently amended) Prosthetic device (1) for inter-vertebral linking comprising
 - (a) a rigid vertebral prosthesis capable of being fixed substantially parallel to the vertebrae of a patient, the prosthesis comprising rigid components (110, 112, 114, 115, 116, 130, 131), loosely connected together in a manner which defines interstices between certain of such components so as to limit of relative movement of such components, and
 - (b) flexible dampers (121, 122, 141, 142) inserted in at least some of the interstices, so as to dampen stresses input into the device (1), the device characterized in that the prosthesis is comprised of a rod (110) elongated along an axis and having end portions on opposite ends of a longitudinal axis, one end portion of which has an end surface adjacent a flange (113) such that one edge of the flange is substantially coplanar with the end surface. Device for flexible inter-vertebral linking (1) characterized in that it is comprised of two sets of means
a first set of means (11) comprised of rigid means (110, 112, 114, 115, 116) made from preferably metallic and bio-compatible materials ensuring the mechanic performance of de device by integrally transmitting the stresses without being distorted
a second set of means (12) made up of flexible or damping means (121 and 122) manufactured out of visco elastic bio compatible materials, tolerating repetitive elastic distortions, the combination of these two sets of means enabling the resistance to mechanic stresses to which it will be subject to, and also enabling to damp them, in order to bring a remedy to all deficiency of the human body anatomical links.

2. (currently amended) The device of claim 1 wherein the components (110, 112, 114, 115, 116, 130, 131) and dampers (121, 122, 141, 142) are made of bio-compatible materials ~~Device for flexible inter vertebral linking (1) according to claim 1 characterized by the fact that the means prosthesis (110) is a mechanic structure consisting of comprising a rod (111) one of the ends of whom is surmounted by a circular plate (113b) related to a rod (111) with a joining radius, the set being slidable in the hollow of the means (114) enclosing the visco elastic element (121)~~

3. (cancelled) ~~Device for flexible inter vertebral linking (1) according to claim 1 characterized in that the mechanical structure (112, 115) is a cap equipped with a thread (117) enabling to fasten the said structure (112, 115) on the structure (114), the means (112, 115) having a shoulder area which encloses the visco elastic means (121) between itself and a plate (113b).~~

4. (currently amended) Device for flexible inter-vertebral linking (1) according to claim 1 characterized in that the rigid components (114) means (114) consists of comprise two hollow cylinders one of which one is tapped in order to enable the fastening of a rod (116) with a threaded tip.

5. (currently amended) Device for flexible intervertebral linking (1) according to claim 1 characterized in that the flexible dampers visco-elastic means comprise are:

~~for (121) a centering ring (121) permitting that the rod (111) should to slide glide in the former's center of the centering ring; and~~

for (122) a solid, substantially cylindrical full disk (122), these means being conceived in order to undergo a large number of stresses by elastic distortion following compression stresses which are not uniformly distributed.

6. (currently amended) Device for flexible intervertebral linking (1) according to claim 1 further characterized in the fact that the flexible dampers (121, 122, 141, 142) visco elastic means (121 and 122) are integrated or enclosed within mechanic structures in a manner so as to protect the flexible dampers (110, 112, 114, 115, 116) thus protected against the environment of the human body, which avoids the formation of fibers that could disturb the operations of the device (1).

7. (cancelled) Device for flexible inter vertebral linking (1) according to claim 1 characterized in that the means (112) is a mechanic structure having an orifice (119) large enough for enabling a clearance of the rod (11) and for there being a functional allowance between the plate (113) and the hollow of the means (114), the said means thus providing that the device operate in tension/compression and flexion.

8. (cancelled) Device for flexible intervertebral linking (1) according to claim 1 characterized in that the means (115) is equipped with thread (117) and comprises a cap (115c) whose orifice (119) is adjusted to the diameter of the rod (110), being extended by a guiding rod (115a), which enable to the device (1) to operate only in the compression mode.

9. (cancelled) Device for flexible intervertebral linking (1) according to claims 1 characterized in that the means (114) has a bore (114a) enabling guidance without excessive friction of the rod (110) in the said means (114).

10. (cancelled) Device for flexible intervertebral linking (1) according to claim 1 characterized in that the diameter of the visco elastic centering rings (121 and 122) is adjusted freely in order to enable them to compress up to a stress threshold corresponding to the contact with the bore (114a) of the means (114).

11. (currently amended). Device for flexible intervertebral linking (1) according to claim 1 further characterized in that the flange (113) is offset from a plane perpendicular to the axis of the elongated rod (116), visco elastic means (141 and 142) are a cylinder and a ring respectively, having an inclined face, enabling thus, thanks to the combination of the set of means (12) with the eccentric orifice (119), that there should be obtained clearances and a damping of the rod following an axis which forms an angle with the rod (131).

12. (currently amended) Device for flexible intervertebral linking (1) according to claim 1 further characterized in that the interstices are formed so as orifice (119) of the set of rigid means (11) enables to limit or to prevent lateral movement of the elongated rod thus limiting motion asymmetrically about the axis the clearance of the rod (110), determining thus that the device should operate, in the desired directions.

13. (new) Prosthetic device for inter-vertebral linking comprising

(a) a rigid vertebral prosthesis capable of being fixed substantially parallel to the vertebrae of a patient, the prosthesis comprising rigid components loosely connected together in a manner which defines interstices between certain of such components so as to limit of relative movement of such components, and

(b) flexible dampers inserted in at least some of the interstices, so as to dampen stresses input into the device, the device characterized in that the flexible dampers comprise dampers made of elastomeric material having end surfaces which are oriented obliquely to, namely, oriented so as to be substantially non-parallel with and non-perpendicular to the longitudinal axis of the rod.

14. (new) The device of claim 12 wherein the components and dampers are made of bio-compatible materials.

15. (new) Prosthetic device for inter-vertebral linking comprising

(a) a rigid vertebral prosthesis capable of being fixed substantially parallel to the vertebrae of a patient, the prosthesis comprising rigid components loosely connected together in a manner which defines interstices between certain of such components so as to limit of relative movement of such components, and

(b) flexible dampers inserted in at least some of the interstices, so as to dampen stresses input into the device, the device characterized in that the interstices comprise interstices formed so as to directionally and, optionally, asymmetrically limit movement.

16. (new) The device for flexible intervertebral linking of claim 15, wherein at least one of the directional interstices formed so as to directionally limit movement is in part defined by a slot having an oblong form through which the rod is inserted, the oblong form directionally limiting transverse motion of the rod.

17. (new) The device of claim 16 wherein the components and dampers are made of bio-compatible materials.

18. (new) Prosthetic device for inter-vertebral linking comprising

(a) a rigid vertebral prosthesis capable of being fixed substantially parallel to the vertebrae of a patient, the prosthesis comprising rigid components loosely connected together in a manner which defines interstices between certain of such components so as to limit of relative movement of such components, and

(b) flexible dampers inserted in at least some of the interstices, so as to dampen stresses input into the device, the device characterized in that the interstices comprise interstices including an aperture which is offset from the axis of the second rod.

19. (new) Device for flexible intervertebral linking (1) according to claim 11, further characterized in that the flexible dampers (121, 122, 141, 142) have non-parallel opposed surfaces which place the rod (110) in a neutral, relaxed position that is not aligned with the axis of a second rod (116).